



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,166	07/30/2001	Terence J. Murphy	TI-33108	7266

23494 7590 04/18/2003

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER

GONZALEZ, JULIO C

ART UNIT PAPER NUMBER

2834

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/682,166

Applicant(s)

MURPHY, TERENCE J.

Examiner

Julio C. Gonzalez

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 19-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9 and 19-43, drawn to an integrated circuit having a piezo element, classified in class 310, subclass 316.01.
- II. Claims 10-18, drawn to an integrated circuit having a piezo element with amplifiers, classified in class 310, subclass 323.17.

1. Applicant's election with traverse of restriction sent on January 23, 2003 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the two inventions should be examined since it would not be a burden on the patent office and that the two inventions are related. This is not found persuasive because Group I does not require having a Class A or AB amplifier connected to received an output of the Class A amplifier and to perform the change from current mode or voltage mode. Also, it is not require to control a piezo element with a Class A amplifier or adjusting the impedance of a Class A amplifier. Also, invention I is completely silent as to what device is being used for driving a circuit. Many other devices other than the ones specified in Invention II may be used to drive a circuit

(switches, controllers, digital gates, etc) and not necessarily class A and AB amplifies as disclosed in invention II.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-9 and 19-43 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims disclose that the piezo element may be driven in either voltage mode or charge mode. What differentiates the voltage mode from the charge mode? How is the switching of the modes done? How the circuit changes when the piezo element is driven in voltage mode? Charge mode? What is define as a voltage mode?

What is define as a charge mode?

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-9 and 19-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The independent claims disclose that a "circuit for compensating said driving circuit for a variable number of piezo elements". What is meant by "compensating"? How is compensation done? Extra voltage? Current? Feedback?

What are considered to be "piezo elements"? Other resonators?

Claims 2, 20, 36, 28 disclose that a "circuit for compensating said driving circuit".

Again how is the compensation done and what is meant by "compensating"?

Claims 3, 21, 29 and 37 disclose a plurality of resistance "selectively" connected.

How are the plurality of resistance selectively connected?

How are the MOSFET devices acting as resistances?

In claims 7, 25, 31 and 39, is the current mode the same as the charge mode? Or is it a different newly introduce mode?

In claims 8, 26, 34 and 42, what is considered to be that the piezo element has a number of piezo element devices? Is the circuitry part of the piezo elements?

Other resonators? In what way the circuitry "compensate" for the piezo element devices?

In claims 9 and 43, the impedance is to be disclosed "a portion of the integrated circuit". From what part of the circuit is the impedance measure? Is only a portion needed all the time?

In order to advance prosecution in the merits, the Prior Art will be applied as best understood by the examiner.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 6-9, 19, 24-27, 32-35 and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontanella et al, Hanks et al and Murray et al.

Fontanella et al discloses a piezo element  $C_{pzt}$  that may be driven in a charge mode (see abstract & figure 2) and a circuitry outputting a signal to the piezo element.

However, Fontanella et al does not disclose that the piezo element may be driven in voltage mode or charge mode.

On the other hand Hanks et al discloses for the purpose of detecting if a piezoelectric device is functional, thus reducing the number of malfunctions in a device that a piezoelectric element may be driven in a voltage mode (see figure 4) or charge mode (see figure 5).

However, neither Fontanella et al nor Hanks et al disclose implicitly that a feedback signal may be used in conjunction with a piezo device.

On the other hand, Murray et al discloses for the purpose of avoiding unwanted energy absorption that a feedback signal is directly link with a piezo element (see figures 4, 2, 1. Moreover, it is disclose that the impedance is related to the voltage of the circuit (column 11, lines 18-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design an integrated circuit as disclosed by Fontanella et al and to modify the invention by using a piezo element that may be driven in a charge or voltage mode for the purpose of detecting if a piezoelectric device is functional, thus reducing the number of malfunctions in a device and to use a feedback and impedance of a circuit for the purpose of avoiding unwanted energy absorption as disclosed by Murray et al.

8. Claims 2, 3, 5, 20, 21, 23, 28, 29, 31, 36, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontanella et al, Hanks et al and Murray et al as applied to claims 1, 19, 27 and 35 above, and further in view of Sullivan.

The combined circuit with a piezo element discloses all of the elements above. However, the combined circuit with a piezo element does not disclose implicitly a circuit for adjusting an output impedance.

On the other hand, Sullivan discloses for the purpose of controlling a resonant frequency in an improved manner, a piezo element 24, a circuit 14 that has means 22 for adjusting an output impedance (see figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined integrated circuit as disclosed above and to modify the invention by adjusting the output impedance of a circuit for the purpose of controlling a resonant frequency in an improved manner as disclosed by Sullivan.



9. Claims 4, 22, 30 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fontanella et al, Hanks et al and Murray and Sullivan as applied to claims 3, 21, 29 and 37 above, and further in view of Liu et al.

The combined circuit with a piezo element discloses all of the elements above. However, the combined circuit with a piezo element does not disclose having a plurality of mosfets connected in series.

On the other hand, Liu et al discloses for the purpose of controlling accurately the resistance in a circuit that mosfets may be connected in series (see figures 3a, 3b, 4a).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined integrated circuit as disclosed above and to modify the invention by connecting mosfets in series for the purpose of controlling accurately the resistance in a circuit as disclosed by Liu et al.

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
NESTOR RAMIREZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

Jcg

April 15, 2003